CASE REPORT

Diagnostic Laparoscopy and Laparoscopic Repair of a Left Paraduodenal Hernia Can Shorten Hospital Stay

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ABSTRACT

Paraduodenal hernias are the most common forms of intraabdominal hernias, accounting for 53% of all internal hernias. However, these account for only 0.2% to 0.9% of all small intestinal obstructions overall. Patients usually report vague abdominal pains and discomfort lasting for many years. Furthermore, in-patient diagnosis and management can last up to several weeks due to its rarity and unusual presentation. We report a case of a left paraduodenal hernia in an 18-year-old male who presented with abrupt onset of abdominal pain, nausea, and vomiting. He was subsequently managed by diagnostic laparoscopy and laparoscopic repair, which decreased the overall inpatient care to 2 days.

Key Words: Left paraduodenal hernia, Laparoscopic repair, Small intestinal obstruction, Hospital stay.

CASE REPORT

An 18-year-old Australian male with no past medical history or surgery presented with abrupt onset of nausea, vomiting, and vague epigastric pain while in-flight to Hawaii. He was immediately taken to a local hospital. Computed tomography (CT) of the abdomen with contrast revealed a distended and edematous jejunum passing behind the mesenteric root, suggesting an intraabdominal herniation **(Figure 1)**. The patient was taken immediately to surgery and underwent diagnostic laparoscopy. Four ports were placed: a 10-mm supraumbilical port for the endoscope and three 5-mm working ports located at the left upper quadrant, right upper quadrant, and right lower quadrant. Multiple dilated small loops of bowel found in the left upper quadrant were carefully separated. A loop of jejunum was found herniated through the left paraduodenal fossa (of Landzert).

Inspection of the small bowel revealed a transition zone at the distal jejunum that was involved in the hernia and this was reduced. No other abnormalities were found. The 2-cm hernia defect was repaired by approximating the surrounding loose areolar tissue together with 3 interrupted 3-0 silk sutures, taking care not to injure the inferior mesenteric vein **(Figure 2)**. The patient tolerated the procedure well and was discharged the following day without sequelae.

DISCUSSION

Paraduodenal hernias (PDH) account for up to 53% of all internal hernias, but they account for only 0.25 to 0.9% of small intestinal obstructions.[1] Males are affected 3:1 versus females, and a left PDH occurs in a ratio of 3:1 versus a right PDH.[2] The exact incidence of PDH is unknown.[2] A recent retrospective study has suggested that this low prevalence may be higher in the general population than previously believed.[1]

At least 477 cases of PDH have been reported in the literature.[2] First described by Moynihan, the exact cause of PDH is still open to debate; however, most authors[3] believe that PDH is the result of an abnormal rotation of the midgut and failure of the mesentery to fuse with the parietal peritoneum. A left PDH is produced if the small

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intestine invaginates the connective tissue beyond the descending mesocolon after failing to fully rotate counterclockwise around the superior mesenteric vein during embryonic development[4] **(Figure 3)**. The paraduodenal fossa is bound medially by a portion of the ascending duodenum, inferiorly by the inferior mesenteric vein (IMV) proper or a branch to the left colic. The duodenojejunal junction is anterior to this fossa and runs posterior to the descending mesocolon. In addition to herniation through the paraduodenal fossa as described in this case, a left PDH can also be produced if the intestine herniates through the fossa mesocolica, which is situated within the transverse mesocolon. This fossa blends with the posterior and dorsal surfaces of the omental bursa. The middle colic artery runs medially and the marginal artery of Drummond anteriorly. Two minor variations of the defect have been described: one where it integrates with the parietal peritoneum along the inferior border of the pancreas and another where the inferior mesenteric vein and pancreas are covered by peritoneum forming the posterior wall of the fossa. The left colic artery is then situated along the inferior border and the fossa extends behind the descending mesocolon and medially to the horizontal portion of the duodenum.[3]

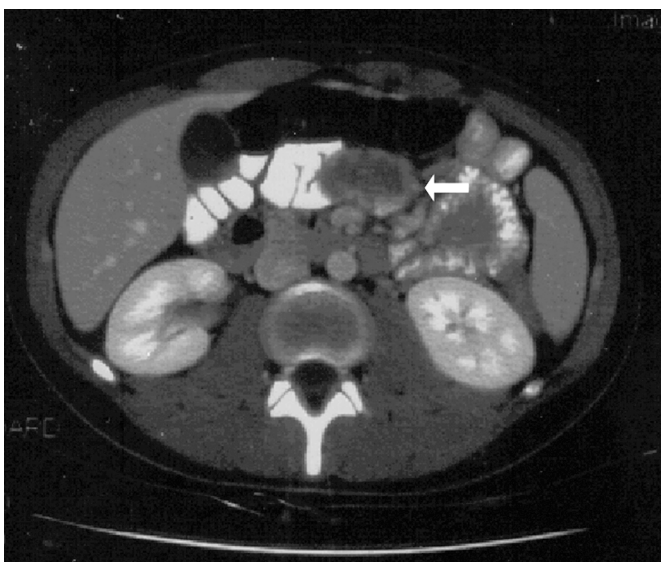

Figure 1. Left paraduodenal hernia. Computed tomography of the abdomen demonstrates loop of small bowel through the paraduodenal fossa.

Clinical diagnosis may be problematic and a high degree of suspicion is required. The majority of PDH are asymptomatic and most are found at laparotomy or autopsy.[5] Chronic recurrent vague abdominal complaints, such as nausea, vomiting, and postprandial pain are the norm if

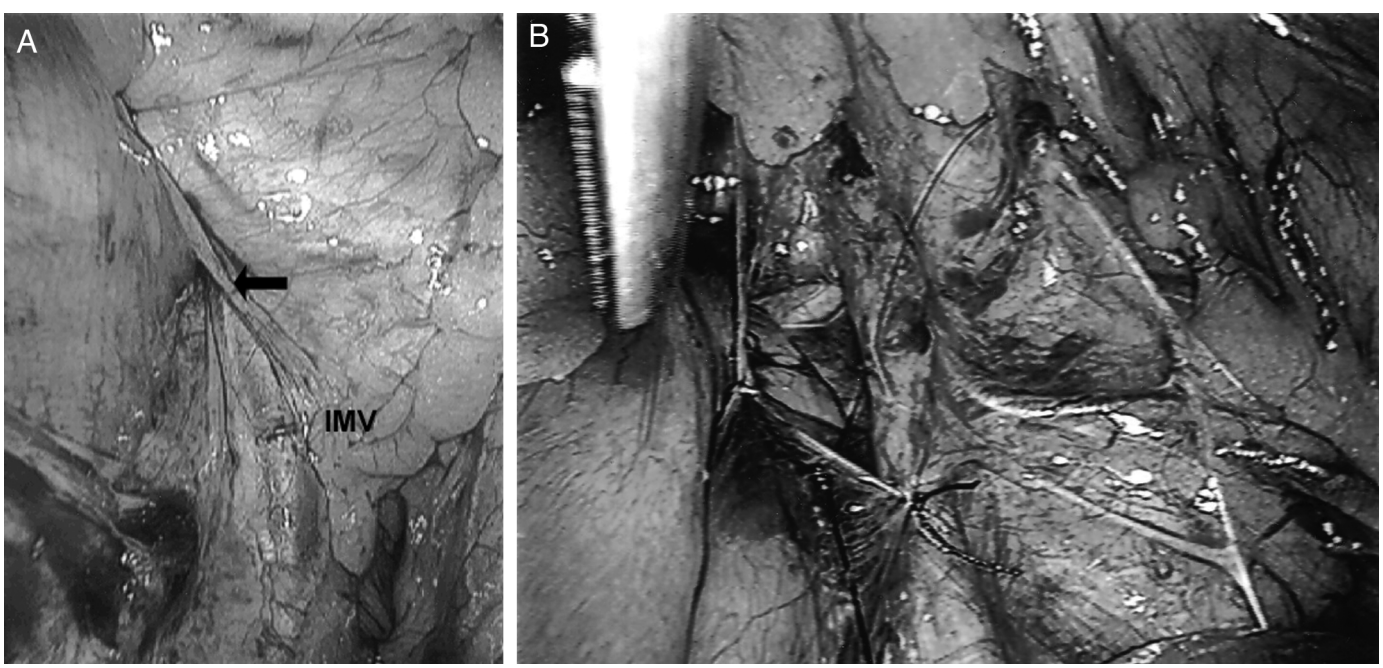

Figure 2. (A) A loop of jejunum was found herniating through the left paraduodenal fossa of Landzert (arrow). Intraoperative photograph shows area after reduction. IMV=Inferior mesenteric vein. (B) The 2.5-cm hernia defect was repaired by approximating the surrounding loose areolar tissue together with 3 interrupted 3–0 silk sutures, taking care not to injure the inferior mesenteric vein.

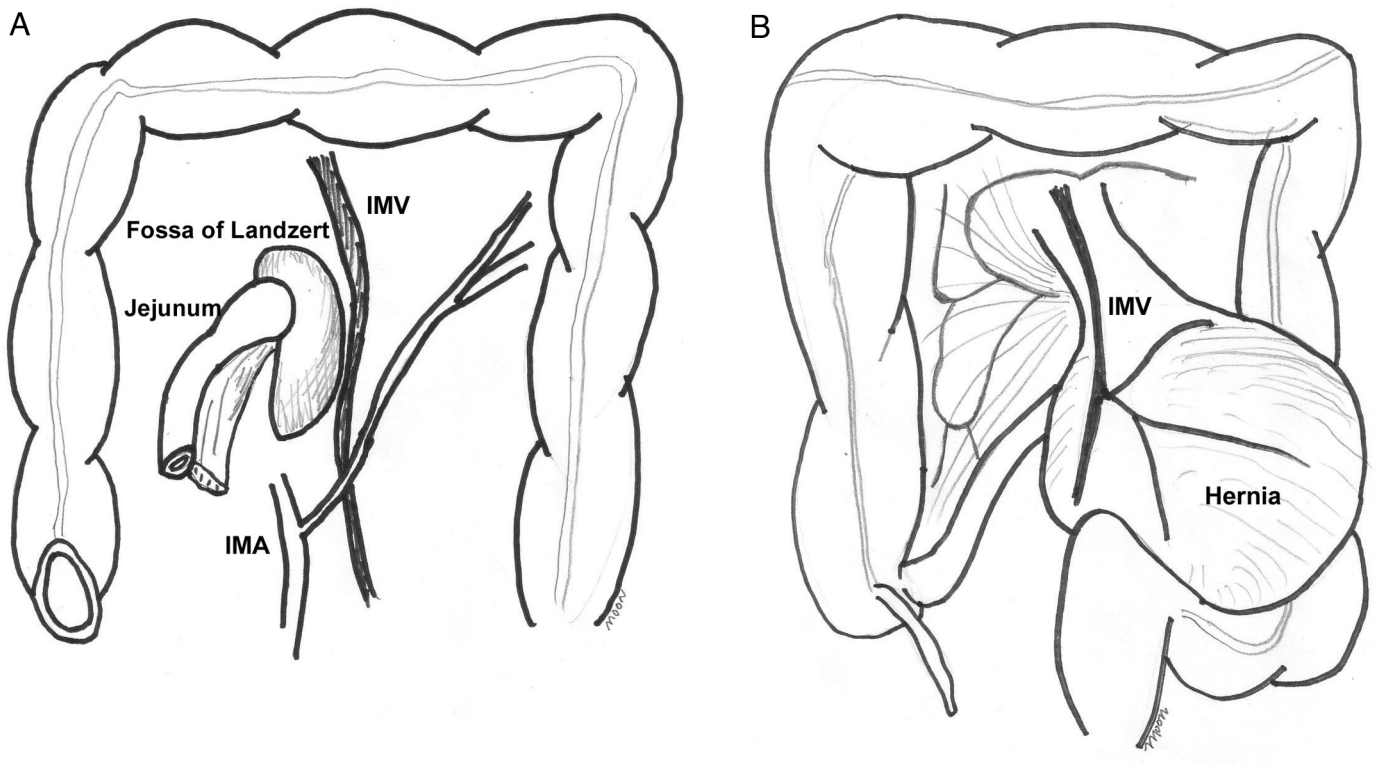

Figure 3. (A) Illustration showing the left paraduodenal fossa (of Landzert). (B) Illustration showing herniation of the small bowel through the left paraduodenal fossa.

symptoms are present.[6] The most common acute presentation is obstruction or strangulation. The lifetime risk of incarceration of PDH is reported to be approximately 50% and, as a result, it is recommended that all incidental PDH be surgically corrected.[6] Mortality ranges from 20% to 50% for acute presentations.[6] Thus, any time-consuming diagnostic workup besides a plain abdominal film may potentially endanger the patient's life.[7] Patients may demonstrate small intestines at the left side of the abdomen that fail to move despite position change.[4] The herniated bowel may appear to have a smooth encapsulated border (Donnelly's border) compared with the normally interdigitating border between bowel loops.[7] Upper endoscopy is not helpful; however, upper gastrointestinal series with a small bowel follow through may show dilated loops of small bowel within the upper quadrant of the abdomen, delay of contrast, or point of obstruction. Abdominal CT of the abdomen with contrast may demonstrate a thickened sheet of peritoneum forming the hernia sac and contrast-filled loops confined to a particular area of the abdomen. With intravenous contrast, displacement of the inferior mesenteric vein may be apparent. Additionally, the contrast-filled loops may be seen to herniate through the various fossas and demonstrate the intimate relations of the surrounding organs. Occasionally, an abdominal mass may be palpable.

Treatment adheres to the principles of all hernia repair: reduction of viscera, restoration of normal anatomy, and closing of the hernia defect.[6] The herniated bowel often reduces by gentle traction as in our case; however, the hernia defect may be enlarged if reduction proves difficult. It may also be enlarged if closure proves difficult. Care should be taken to enlarge the defect away from the edge of the inferior mesenteric vein. Although some authors have described dividing the IMV during the repair, most authors leave it intact, as in our case.[4]

Traditionally, PDH has been repaired via a laparotomy, which required a lengthy hospital stay. Review of the literature shows these hernias are usually diagnosed after extensive evaluation while the patient is hospitalized for acute abdominal pain or obstruction **(Table 1)**. Recently, 2 reports of laparoscopic repair have been described.[8,9] These case reports demonstrate the feasibility of laparoscopic repair. However, the overall hospital stay remained similar to stay in older reports, lasting from several days to

Table 1.
Duration of Hospital Stay

Author	Hospital Stay
Bartlett, et al (5 cases)[10]	At least 3 days to several weeks
Cole (1 case)[11]	At least 8 days
Khan, et al (3 cases)[12]	At least 6 days
Dritsas, et al (2 cases)[13]	At least 7 days
Huang, et al (1 case)[14]	At least 4 days
Patterson, et al (1 case)[15]	At least 8 days
Uematsu, et al (1 laparoscopic case)[9]	At least 28 days
Finck, et al (1 laparoscopic case)[8]	At least 3 days
Haymond, et al (2 cases)[16]	At least 14 days

several weeks. This may be due to a lengthy workup without the aid of a diagnostic laparoscope. Diagnostic laparoscopy offers an attractive option to quickly make this diagnosis by eliminating the need for other studies. By having a high index of suspicion for an internal hernia, we have shown that it can be advantageous to perform a diagnostic laparoscopy coupled with a laparoscopic repair of paraduodenal hernias to shorten the overall hospital course to as little as 2 days.

References:

1. Yoo HY, Mergelas J, Seibert DG. Paraduodenal hernia: a treatable cause of upper gastrointestinal tract symptoms. *J Clin Gastroenterol.* 2000;31:226–229.

2. Brigham RA, Fallon WF, Saunders JR, Harmon JW, d'Avis JC. Paraduodenal hernia: diagnosis and surgical management. *Surgery.* 1984;96:498–502.

3. Estrada RL. The paraduodenal hernias. *Can J Surg.* 1982;25: 7–8.

4. Tireli M. Left paraduodenal hernia. *Br J Surg.* 1982;69:114.

5. Sullivan LP, Davidson PG, Berliner LF. Left paraduodenal hernia. *NY State J Med.* 1991;91:315–317.

6. Tong RSK, Sengupta S, Tjandra JJ. Left paraduodenal hernia: case report and review of the literature. *ANZ J Surg.* 2002;72:69–71.

7. Pershad J, Simmons G, Chung D, Frye T, Marques MB. Two acute pediatric abdominal catastrophes from strangulated left paraduodenal hernias. *Pediatr Emerg Care.* 1998;14:347–349.

8. Finck CM, Barker S, Simon H, Marx W. A novel diagnosis of left paraduodenal hernia through laparoscopy. *Surg Endosc.* 2000;14:87.

9. Uematsu T, Kitamura H, Iwase M, et al. Laparoscopic repair of a paraduodenal hernia. *Surg Endosc.* 1998;12:50–52.

10. Bartlett MK, Wang CA, Williams WH. The surgical management of paraduodenal hernia. *Ann Surg.* 1968;168:249–254.

11. Cole SD. Left paraduodenal hernia: Report of a case, with radiographic findings, including abdominal computed tomography. *J Am Osteo Assoc.* 1987;87:556–559.

12. Khan MA, Lo AY, Van de Maele DM. Paraduodenal hernia. *Am Surg.* 1998;64:1218–1222.

13. Dritsas ER, Ruiz OR, Kennedy M, Blackford J, Hasl D. Paraduodenal hernia: A Report of two cases. *Am Surg.* 2001;67: 733–736.

14. Huang YC, Chen HL, Hsu WM, Chen SJ, Lai MW, Chang MH. Left paraduodenal hernia presenting as intestinal obstruction: Report of one case. *ACTA Paediatr Tw.* 2001;42:172–174.

15. Patterson JA, Tadros EG, Wilkinson AJ. An unusual case of left paraduodenal hernia. *Int J Clin Pract.* 55:649, 2001. Review.

16. Haymond HE, Dragstedt LR. Anomalies of intestinal rotation: A Review of the literature with report of two cases. *Surg Gyncol Obstet.* 1931;53:316–328.